

FORM PCT/US 390 (Modified)
(REV 11-98)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

0182.00004

TRANSMITTAL LETTER TO THE UNITED STATES

DESIGNATED/ELECTED OFFICE (DO/EO/US)

CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

09/806807

INTERNATIONAL APPLICATION NO.

PCT/IB99/01568

INTERNATIONAL FILING DATE

22 September 1999

PRIORITY DATE CLAIMED

9 October 1998

TITLE OF INVENTION

A WINDSCREEN WIPER

APPLICANT(S) FOR DO/EO/US

Swanepoel

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☒ Certificate of Mailing by Express Mail
20. ☒ Other items or information:

Postcard

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 1.53) 09/806807	INTERNATIONAL APPLICATION NO. PCT/IB99/01568	ATTORNEY'S DOCKET NUMBER 0182.00004
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21. The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **\$1,000.00**
- ☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **\$860.00**
- ☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **\$710.00**
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) **\$690.00**
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) **\$100.00**

ENTER APPROPRIATE BASIC FEE AMOUNT =**CALCULATIONS PTO USE ONLY****\$860.00**

Surcharge of **\$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).

\$0.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	12 - 20 =	0	x \$18.00	\$0.00	
Independent claims	4 - 3 =	1	x \$80.00	\$80.00	
Multiple Dependent Claims (check if applicable). <input type="checkbox"/>				\$0.00	
TOTAL OF ABOVE CALCULATIONS =				\$940.00	
Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable). <input type="checkbox"/>				\$0.00	
SUBTOTAL =				\$940.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).				\$0.00	
TOTAL NATIONAL FEE =				\$940.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). <input type="checkbox"/>				\$0.00	
TOTAL FEES ENCLOSED =				\$940.00	
				Amount to be: refunded	\$
				charged	\$

☒ A check in the amount of **\$940.00** to cover the above fees is enclosed.

☐ Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **02-2712** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Gerald E. McGlynn, III
Bliss McGlynn, P.C.
2075 West Big Beaver Rd., Suite 600
Troy, MI 48084

SIGNATURE

Gerald E. McGlynn, III

NAME

33,737

REGISTRATION NUMBER

April 3, 2001

DATE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Swanepoel, Adriaan Retief)
Serial No.: Unknown)
Filing Date: April 2, 2001)
For: A WINDSCREEN WIPER)
_____)

PRELIMINARY
AMENDMENT

Assistant Commissioner for Patents
Washington, DC 20231

Dear Sir:

Prior to examination, please amend the above-identified application as follows:

IN THE SPECIFICATION:

On page 1 of the amended specification submitted on September 8, 2000 in connection with the PCT application No. PCT/IB99/01568, after the title, and before the first paragraph of the specification, please insert the following heading:

BACKGROUND OF THE INVENTION

(1) *Field of the Invention*

On page 1 of the amended specification submitted on September 8, 2000 in connection with the PCT application No. PCT/IB99/01568, line 13 and before the second full paragraph on this page, please insert the following new heading:

(2) *Description of the Related Art*

On page 4 of the application as originally filed, before the first full paragraph, please insert the following new heading:

BRIEF DESCRIPTION OF THE DRAWINGS

On page 4 of the application as originally filed, at line 95, please insert the following new heading:

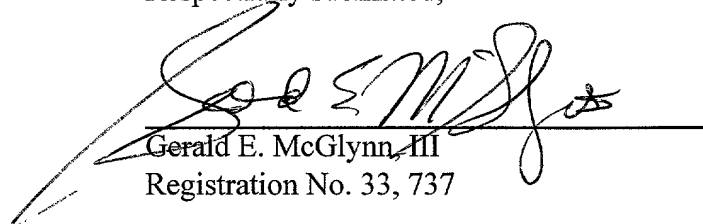
DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

REMARKS

Claims 1-13 were originally pending in the PCT application to which priority is claimed in this case. In a communication dated September 8, 2000, applicant submitted new page 1 that included references to EP-A-0 528 643 and DE-A-196 51 229 in the background section of the application as well as new claims 1-12. By way of this Preliminary Amendment, the specification has been amended to conform to standard U.S. patent practice. No new matter has been added.

The applicant respectfully submits that the claims clearly distinguish over the prior art and are therefore allowable. Accordingly, applicant respectfully solicits favorable action toward allowance of the claims pending in this case.

Respectfully submitted,



Gerald E. McGlynn, III
Registration No. 33, 737

BLISS McGLYNN, P.C.
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Troy, MI 48084
(248) 649-6090

Date: April 3, 2001
Attorney Docket No. 0182.00004

A WINDSCREEN WIPER

This invention relates to a windscreen wiper, which is also known as a windshield wiper.

The invention relates in particular to a windscreen wiper which has a curved backbone and which may have a varying width and/or thickness. It will be appreciated by those skilled in the art that the backbone may be in the form of a beam that is such as in EP-A-0 528 643 and DE-A-196 51229 curved in a plane or may have a compound curvature. The beam will have width and thickness dimensions. The beam will also have a radius of curvature at each point along its length.

The applicant has conducted substantial analysis and experimentation and believes that he has found a relationship between the width, the beam material's Young's modulus and the total length of the beam and the thickness, the beam material's Young's modulus and the total length, which provides a windscreen wiper that operates in an improved manner.

In this specification, the term "spatially consolidated" is to be understood, unless the context clearly indicates otherwise, to mean that the actual perimeters of a cross-section coincides with the shortest possible perimeter encapsulating that cross-section.

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According to a first aspect of the invention there is provided a windscreen wiper which includes

an elongate curved backbone which is of a resiliently flexible material having a Young's modulus of between 50 to 350 GPa, the backbone having a substantially spatially consolidated cross-sectional profile at substantially all points along its length, in which the magnitude of the width at substantially the widest point along the backbone, W_m (expressed in millimetres) is at most $(-8.889 \cdot 10^{-5} * E + 0.05378) * L - 5.25$, where L is the total length of the backbone expressed in millimetres and E is the Young's modulus of the backbone material expressed in GPa.

Further according to this aspect, there is provided a windscreen wiper which includes

an elongate curved backbone which is of a resiliently flexible material having a Young's modulus of between 50 to 350 GPa, the backbone having a substantially spatially consolidated cross-sectional profile at substantially all points along its length, in which the ratio of the magnitude of the width at substantially the widest point along the backbone, to the total length L of the backbone, R_w is at most $(-8.889 \cdot 10^{-5} * E + 0.05378) - 5.25/L$, where L is the total length of the backbone expressed in millimetres and E is the Young's modulus of the backbone material expressed in GPa.

According to a second aspect of the invention there is provided a windscreen wiper which includes

an elongate curved backbone which is of a resiliently flexible material having a Young's modulus of between 50 to 350 GPa, the backbone having a substantially spatially consolidated cross-sectional profile at substantially all points along its length,

in which the magnitude of the thickness at substantially the thickest point along the backbone, T_m (expressed in millimetres) is at most $0.0007 * L - 0.0027407 * E + 1.37814$, where L is the total length of the backbone expressed in millimetres and E is the Young's modulus of the backbone material expressed in GPa.

Further according to this aspect, there is provided a windscreen wiper which includes

an elongate curved backbone which is of a resiliently flexible material having a Young's modulus of between 50 to 350 GPa, the backbone having a substantially spatially consolidated cross-sectional profile at substantially all points along its length, in which the ratio of the magnitude of the thickness at substantially the thickest point along the backbone to the total length L of the backbone, R_t is at most $0.0007 - (0.0027407 * E - 1.37814)/L$, where L is the total length of the backbone expressed in millimetres and E is the Young's modulus of the backbone material expressed in GPa.

The material of the backbone may be a composite material. In this case, the Young's modulus will be that of the composite material.

The total length of the backbone may be between about 300mm to 1200mm.

The backbone may have a varying width and or thickness, along its length. The backbone may have a free form curvature in a plane or may have a compound curvature (that is, curved in two planes).

The invention is now described, by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a schematic perspective view from above of a windscreen wiper in accordance with the invention;

Figure 2 shows a side view of the wiper of Figure 1 in an unloaded free-form condition;

Figure 3 shows a graph indicating the variation of width of the backbone of the windscreen wiper shown in Figures 1 and 2;

Figure 4 shows a graph indicating the variation of thickness of the backbone of the windscreen wiper shown in Figures 1 and 2; and

Figure 5 shows a graph indicating the free-form co-ordinates of the centre line of the backbone of the windscreen wiper shown in Figures 1 and 2.

In the drawings, a windscreen wiper in accordance with the invention is generally designated by the reference numeral 10. The windscreen wiper 10 includes a backbone 12 which is in the form of a beam and a rubber wiper blade 14. The beam is made from spring steel having a Young's modulus of 200 GPa. The length of the beam is 600mm. The beam has a rectangular cross-sectional profile at all points along its length. Thus, the beam has a width dimension W and a thickness dimension T as shown in Figure 1. The beam tapers both in width and thickness from its centre toward its free ends or tips as shown in Figure 3 and Figure 4 respectively. Figure 3 illustrates the beam width (in millimetres) at various positions along the length of the beam, which is also measured in millimetres. Figure 4 illustrates the thickness of the beam (in millimetres) at various positions along the length of the beam which is also measured in millimetres.

The beam is curved longitudinally, in a plane, with a predetermined radius of curvature R at every point along its length as shown in Figure 2. Figure 5 shows the beam centre line co-ordinates relative to the position along the length of the beam (in millimetres).

With the given formulas, it can be determined if the wiper, as described in the drawings conforms to the invention. The width of the beam 12 at its widest point along the beam 12, W_m (expressed in millimetres) is 15.4 as shown in Figure 3. According to the first aspect of the invention, the magnitude of the width at the widest point along the beam 12, W_m (expressed in millimetres), where L is 600 mm and E is 200 GPa, should be less than $(-8.889 \cdot 10^{-5} * E + 0.05378) * L - 5.25 = (-8.889 \cdot 10^{-5} * 200 + 0.05378) * 600 - 5.25 = 16,35$ mm. The width W_m of the wiper therefore falls within the scope of the invention.

The thickness of the beam 12 at the thickest point along the beam 12, T_m (expressed in millimetres) is 1.2 mm as shown in Figure 4. According to the second aspect of the invention the magnitude of the thickness at the thickest point along the beam 12, T_m (expressed in millimetres), where L is 600 mm and E is 200 GPa, should be less than $0.0007 * L - 0.0027407 * E + 1.37814 = 0.0007 * 600 - 0.0027407 * 200 + 1.37814 = 1,25$ mm. The thickness T_m of the wiper therefore also falls with the scope of the invention.

CLAIMS

1. A windscreen wiper (10) which includes

an elongate curved backbone (12) which is of a resiliently flexible material having a Young's modulus of between 50 GPa to 350 GPa, the backbone having a substantially spatially consolidated cross-sectional profile at substantially all points along its length,

characterised therein that the magnitude of the width at substantially the widest point along the backbone, W_m (expressed in millimetres) is at most $(-8.8889 \times 10^{-5} * E + 0.05378) * L^{-5.25}$, where L is the total length of the backbone expressed in millimetres and E is the Young's modulus of the backbone material expressed in GPa.

2. A windscreen wiper (10) which includes

an elongate curved backbone (12) which is of a resiliently flexible material having a Young's modulus of between 50 GPa to 350 GPa, the backbone having a substantially spatially consolidated cross-sectional profile at substantially all points along its length,

characterised therein that the ratio of the magnitude of the width at substantially the widest point along the backbone, to the total length L of the backbone, R_{WY} is at most $(-8.8889 \times 10^{-5} * E + 0.05378) - 5.25/L$, where L is the total length of the backbone expressed in millimetres and E is the Young's modulus of the backbone material expressed in GPa.

3. A windscreen wiper (10) which includes

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an elongate curved backbone (12) which is of a resiliently flexible material having a Young's modulus of between 50 GPa to 350 GPa, the backbone having a substantially spatially consolidated cross-sectional profile at substantially all points along its length,

characterised therein that the magnitude of the thickness at substantially the thickest point along the backbone, T_m (expressed in millimetres) is at most $0.0007 * L - 0.0027407 * E + 1.37814$, where L is the total length of the backbone expressed in millimetres and E is the Young's modulus of the backbone material expressed in GPa.

4. A windscreen wiper (10) which includes

an elongate curved backbone (12) which is of a resiliently flexible material having a Young's modulus of between 50 GPa to 350 GPa, the backbone having a substantially spatially consolidated cross-sectional profile at substantially all points along its length,

characterised therein that the ratio of the magnitude of the thickness at substantially the thickest point along the backbone, to the total length L of the backbone, R_t is at most $0.0007 - (0.0027407 * E + 1.37814)/L$, where L is the total length of the backbone expressed in millimetres and E is the Young's modulus of the backbone material expressed in GPa.

5. The windscreen wiper as claimed in Claim 1, characterised therein that the material of the backbone is a composite material, with the Young's modulus being that of the composite material.

6. The windscreen wiper as claimed in Claim 3, characterised therein that the

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material of the backbone is a composite material, with the Young's modulus being that of the composite material.

7. The windscreen wiper as claimed in Claim 1, characterised therein that the backbone has a varying width and thickness along its length.

8. The windscreen wiper as claimed in Claim 1, characterised therein that the backbone has a free form curvature in a plane.

9. The windscreen wiper as claimed in Claim 1, characterised therein that the backbone has a compound curvature.

10. The windscreen wiper as claimed in Claim 3, characterised therein that the backbone has a varying width and thickness along its length.

11. The windscreen wiper as claimed in Claim 3, characterised therein that the backbone has a free form curvature in a plane.

12. The windscreen wiper as claimed in Claim 3, characterised therein that the backbone has a compound curvature.

AMENDED SHEET

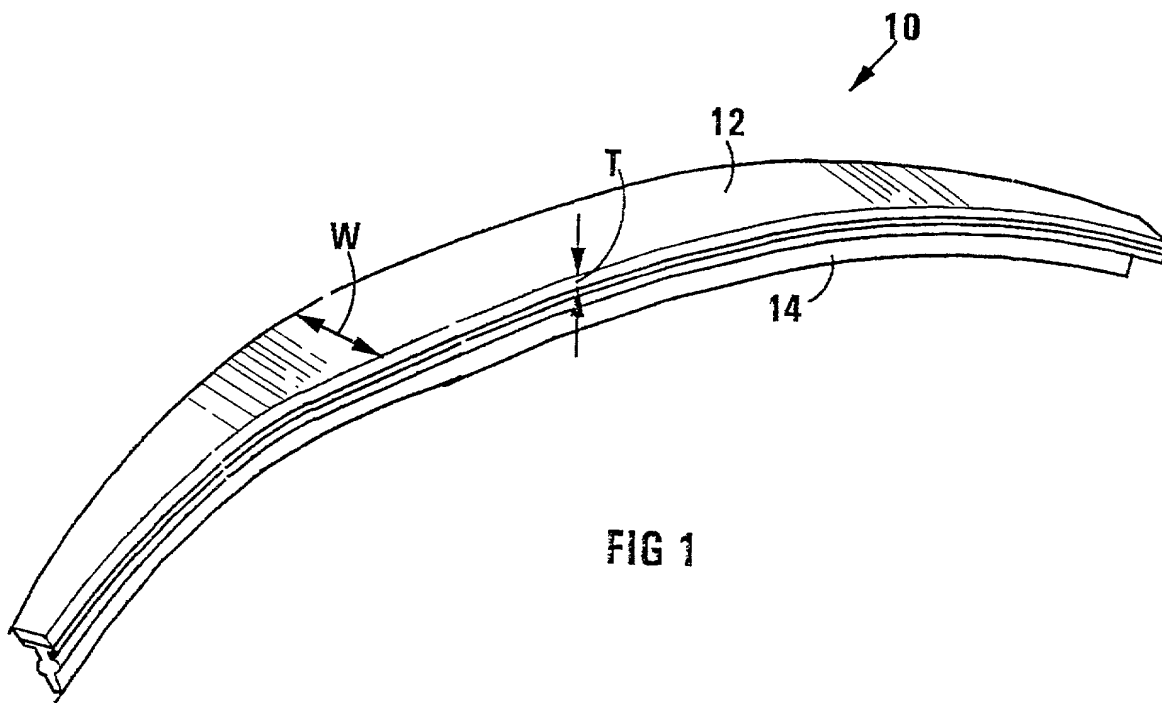


FIG 1

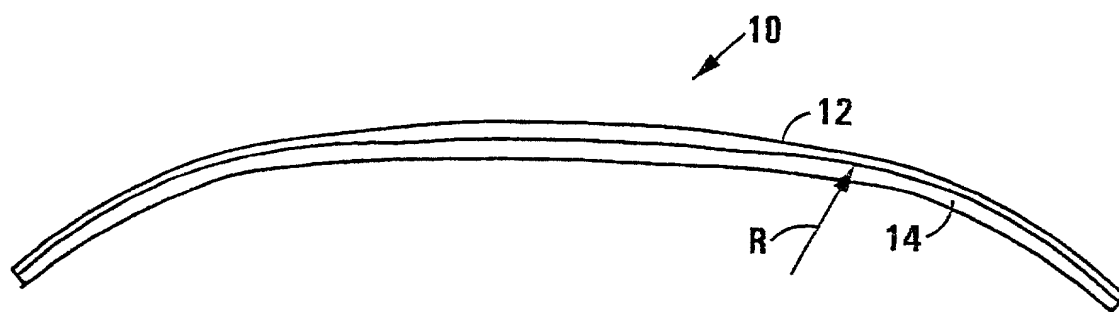


FIG 2

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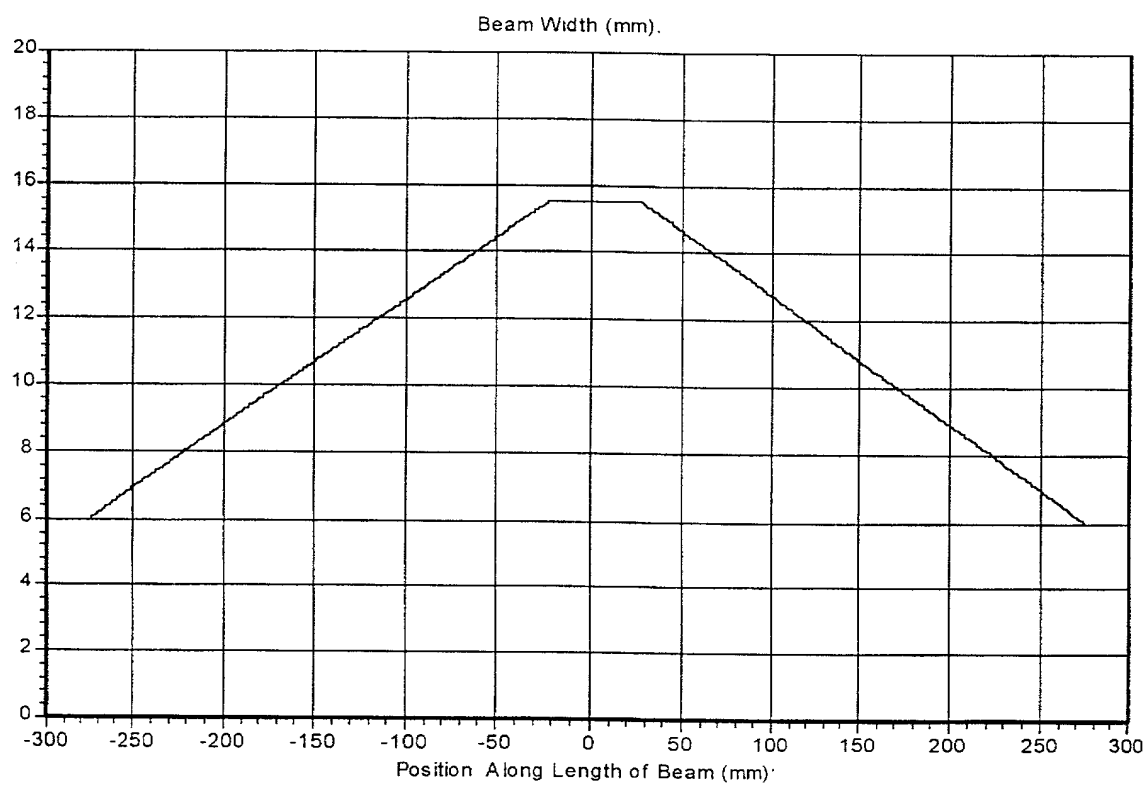


FIGURE 3

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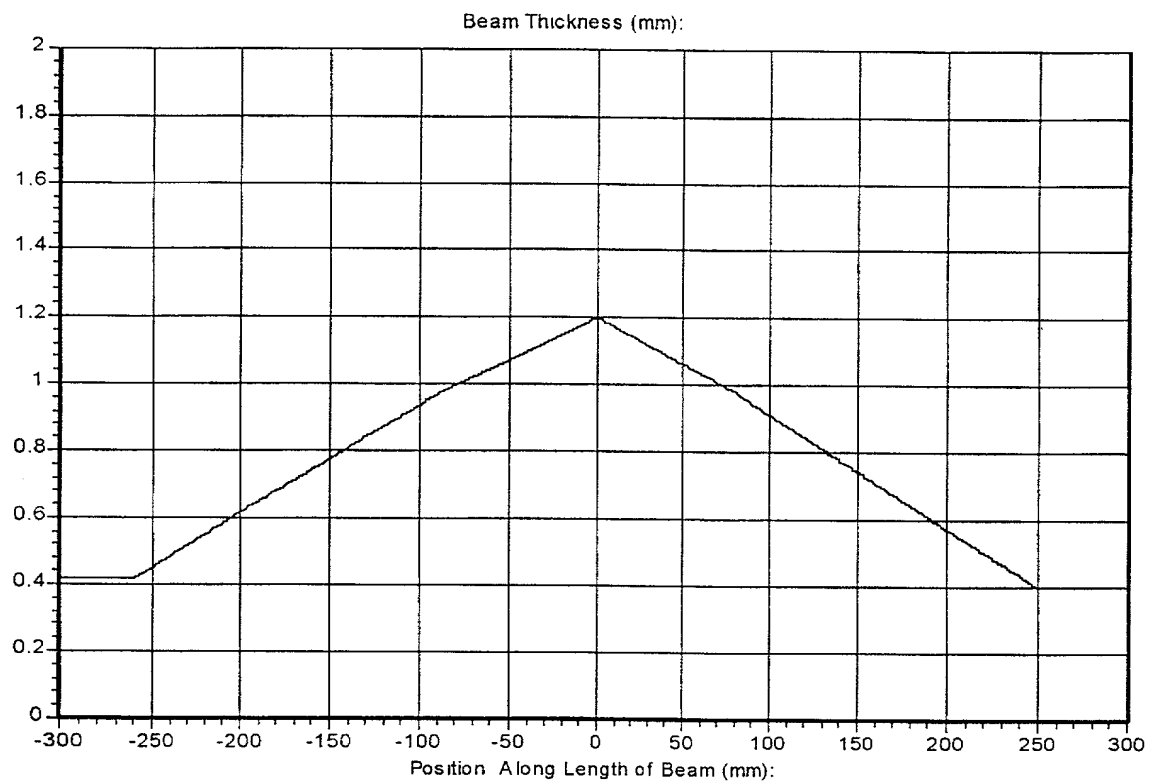


FIGURE 4

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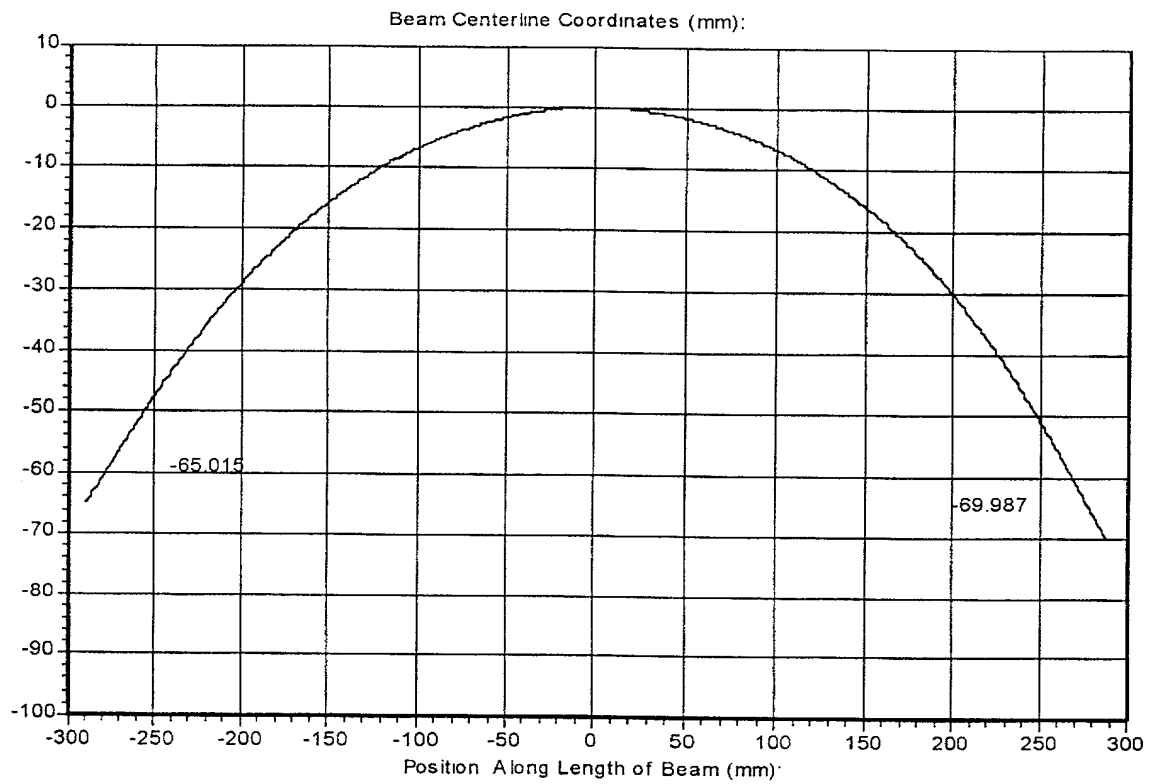


FIGURE 5

Docket No.

0182.00004

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled
A WINDSCREEN WIPER

the specification of which

(check one)

☐ is attached hereto.

☒ was filed on 22 September 1999 as United States Application No. or PCT International Application Number PCT/IB99/01568
 and was amended on 8 September 2000
 (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

<u>98/9243</u>	<u>South Africa</u>	<u>9 October 1998</u>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	
<u>PCT/IB99/01568</u>	<u>PCT</u>	<u>22 September 1999</u>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	
<u></u>	<u></u>	<u></u>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(list name and registration number)*

Daniel H. Bliss, Reg. No. 32,398

Gerald E. McGlynn, III, Reg. No. 33,737

Brian S. Pickell, Reg. No. 45,013

3

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Full name of sole or first inventor

Adriaan Retief Swanepeel *Swanepeel*

Sole or first inventor's signature

Swanepeel

Date

30 Apr 2001

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Citizenship

South Africa

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Full name of second inventor, if any

Second inventor's signature

Date

Residence

Citizenship

Post Office Address